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FILE 'CAPLUS' ENTERED AT 14:11:08 ON 03 FEB 2004

L1 0 ((UNBURN? (3A) CARBON) OR "POST-FLAME") (S) RADIATION (S)  
(SENSOR? OR DETECTOR?)  
L2 4 "POST-FLAME" (S) RADIATION  
L3 4849 RADIATION (S) (COMBUST? OR FLAME OR POST-FLAME)  
L4 123 L3 AND MONITOR?  
L5 8 L4 AND (RADIAT? (4A) SENSOR?)  
L6 275 RADIAT? (S) CARBON? (S) (COMBUST? OR POST-FLAME OR FLAME)  
L7 7 L6 AND UNBURN?  
L8 2 ((NITROGEN NEAR2 OXIDE?) OR "NOX") (S) RADIATION (S) SENSOR?  
L9 1190 ((NITROGEN NEAR2 OXIDE?) OR "NOX") (S) SENSOR?  
L10 1190 L9 AND SENSOR?  
L11 0 L9 AND RADOATION  
L12 8 L9 AND RADIATION

L1 ANSWER 1 OF 9 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 2003:592211 CAPLUS

DOCUMENT NUMBER: 139:216476

TITLE: Numerical simulation of combustion in a yellow-phosphor burning tower

AUTHOR(S): Mei, Yi; Liu, Qiusheng; Huang, Xiaoyang; Gao, Qi; Huang, Weifeng

CORPORATE SOURCE: Yunnan Research Institute of Chemical Industry, Kunming, 650041, Peop. Rep. China

SOURCE: Qinghua Daxue Xuebao, Ziran Kexueban (2003), 43(5), 676-679

CODEN: QDXKE8; ISSN: 1000-0054

PUBLISHER: Qinghua Daxue Chubanshe

DOCUMENT TYPE: Journal

LANGUAGE: Chinese

AB Phosphoric acid is produced by burning yellow phosphor. The design of a yellow-phosphor burning tower needs accurate anal. of the combustion pattern and the flow in the tower. The turbulent combustion flow in a burning tower was simulated numerically using the finite volume method and a SIMPLE algorithm which included thermal radiation effects. The model predicted the mass fraction distributions and the temperature and velocity distributions for anal. of the flow field in the tower. The numerical results agree well with exptl. data.

L1 ANSWER 2 OF 9 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 2003:561295 CAPLUS

DOCUMENT NUMBER: 139:119260

TITLE: Combustion monitoring using infrared array-based detectors

AUTHOR(S): Carter, Chris F.; Cross, Nicola

CORPORATE SOURCE: Towcester Mill, Irisys Ltd, Towcester, NN12 6AD, UK

SOURCE: Measurement Science and Technology (2003), 14(7), 1117-1122

CODEN: MSTCEP; ISSN: 0957-0233

PUBLISHER: Institute of Physics Publishing

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A new generation of low-cost IR array-based imaging systems were put to trial within a combustion control instrumentation project. Being pyroelec. based, the device can be operated as a turbulence sensor if the scene is viewed directly or as a thermal imager by interposing a mech. chopper. From both scientific and engineering aspects the strong carbon dioxide emission band at 4.4  $\mu\text{m}$  is an ideal target for the sensor and is always observable from carbonaceous flames in reasonable contrast against a hot background. Data from such an array are processed using powerful algorithms resident on a local digital signal processor, so promising a very low-cost route to a final instrument. A wide range of algorithm classes was developed: initially in a "Windows" environment but later transferred to the processor; these make use of both temporal and spatial features in the image stream. The most promising control algorithms demonstrated to date involve statistical measures of pixel activity.

REFERENCE COUNT: 8

L1 ANSWER 3 OF 9 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 2003:284059 CAPLUS

DOCUMENT NUMBER: 139:216824

TITLE: Thermal radiation and chemical reactions in combustion of biofuels

AUTHOR(S): Nilsson, T. K.; Sundén, B.

CORPORATE SOURCE: Department of Heat and Power Engineering, Division of Heat Transfer, Lund Institute of Technology, Lund, S-221 00, Swed.

SOURCE: International Journal of Energy Research (2003), 27(4), 389-399

CODEN: IJERDN; ISSN: 0363-907X

PUBLISHER: John Wiley & Sons Ltd.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A comprehensive numerical method was used to analyze thermal radiation and chemical reactions in fixed-bed combustion of biofuels (e.g., wood). The overfire air region and the bed were modelled simultaneously using a finite volume method. The SIMPEC algorithm is preferred compared to SIMPLE in handling the pressure-velocity linkage in this case. The model provided reasonable distributions of the temperature distribution but some parameters,  $\omega$  (a weighting factor),  $d_p$  the particle diameter, and the porosity distribution should be chosen carefully.

REFERENCE COUNT: 15

L1 ANSWER 4 OF 9 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 2002:370537 CAPLUS

DOCUMENT NUMBER: 136:403647

TITLE: Spectral model of absorption and scattering of thermal radiation by diesel fuel droplets

AUTHOR(S): Dombrovsky, L. A.

CORPORATE SOURCE: IVTAN (Institute of High Temperatures) Scientific Association, Russian Academy of Sciences, Moscow, 127412, Russia

SOURCE: High Temperature (Translation of Teplofizika Vysokikh Temperatur)  
(2002), 40(2), 242-248

CODEN: HITEA4; ISSN: 0018-151X

PUBLISHER: MAIK Nauka/Interperiodica Publishing

DOCUMENT TYPE: Journal

LANGUAGE: English

AB An approx. description is given of the basic characteristics of absorption and scattering of IR radiation by polydisperse droplets of diesel fuel. It is demonstrated that the commonly used model of gray medium fails to give reliable values of radiation flux from the combustion products to fuel droplets. The use of the spectral band model made it possible to construct a valid efficient algorithm for the calcn. of radiation heat transfer for the conditions of a diesel combustor. REFERENCE COUNT: 11

L1 ANSWER 5 OF 9 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 2002:121539 CAPLUS

DOCUMENT NUMBER: 136:373783

TITLE: A mixture fraction combustion model for large scale fire modeling

AUTHOR(S): McGrattan, Kevin; Floyd, Jason; Hostikka, Simo

CORPORATE SOURCE: Building and Fire Research Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, 20899, USA

SOURCE: HTD (American Society of Mechanical Engineers) (2001), 369-4(Proceedings of the ASME Heat Transfer

Division--2001, Volume 4), 149-153

CODEN: ASMHD8; ISSN: 0272-5673

PUBLISHER: American Society of Mechanical Engineers

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A numerical fire model, Fire Dynamics Simulator, is being developed at NIST to study fire behavior and to evaluate the performance of fire protection systems in buildings. To date, about half of the applications of the model have been for design of smoke handling systems and sprinkler/detector activation studies. The other half consists of residential and industrial fire reconstructions. Improvements are being made to address the second set of applications, most importantly a mixture fraction combustion model and a finite volume radiation transport algorithm using either a gray gas or a wide band assumption. The methods will be discussed and a sample calcn. presented.

REFERENCE COUNT: 5

L1 ANSWER 6 OF 9 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1997:258962 CAPLUS

DOCUMENT NUMBER: 126:279521

TITLE: "Incorporation of an efficient turbulent radiation algorithm into a discrete transfer program"

AUTHOR(S): Hall, Robert J.; Vranos, Alexander

CORPORATE SOURCE: UTRC East Hartford, CT, USA

SOURCE: Heat and Technology (Pisa) (1995), 13(2), 155-168

CODEN: HETEEE; ISSN: 0392-8764

PUBLISHER: Edizioni ETS  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB This paper will show that turbulence effects on combustion radiation can be described accurately and efficiently in a way that can be incorporated into conventional radiation solution algorithms if one has knowledge of the pdf for turbulent fluctuations. It will be shown by application to turbulent diffusion flames that the technique gives results equivalent to more cumbersome Monte Carlo approaches, and that it can be readily incorporated into the geometrically versatile discrete transfer radiation algorithm. Associated with the turbulent radiation anal., the paper will also discuss the incorporation of realistic spectral models for gas and soot emission into the discrete transfer algorithm. The coupling of this turbulent radiation algorithm with a soot formation model and a CFD solver are also discussed.

L1 ANSWER 7 OF 9 CAPLUS COPYRIGHT 2003 ACS on STN  
ACCESSION NUMBER: 1994:536960 CAPLUS  
DOCUMENT NUMBER: 121:136960  
TITLE: Computer modeling of complex heat-exchange in jet-torch systems  
AUTHOR(S): Malikov, G. K.; Shleimovich, E. M.; Lobanov, D. L.  
CORPORATE SOURCE: VNIIMT, Yekateninburg, Russia  
SOURCE: Promyshlennaya Teplotekhnika (1993), 15(2), 22-7  
CODEN: PRTLTD9; ISSN: 0204-3602  
DOCUMENT TYPE: Journal  
LANGUAGE: Russian

AB The computation procedure is suggested which permits the numerical simulation of complex heat exchange in the jet-torch systems to be conducted allowing for hydrodynamics, radiation selectivity and turbulent combustion using the effective computation algorithms.

L1 ANSWER 8 OF 9 CAPLUS COPYRIGHT 2003 ACS on STN  
ACCESSION NUMBER: 1994:274336 CAPLUS  
DOCUMENT NUMBER: 120:274336  
TITLE: "A high framing rate dual-band infrared imaging system and spectral analysis algorithm for flame studies"  
AUTHOR(S): *Jiang, H.; Rhee, K. T.*  
CORPORATE SOURCE: Dep. Mech. Aerosp. Eng., Rutgers, State Univ. New Jersey, Piscataway, NJ, 08855, USA  
SOURCE: **Chemical and Physical Processes in Combustion (1993) 358-61**  
CODEN: CPPCD9; ISSN: 0277-1128  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB A flame diagnostic method is presented. This method combines a high-speed dual-band IR imaging system and the spectral anal. algorithm, which permits not only flow visualization of combustion products but also determination of distributions of temperature and species in the gaseous flame zone. Processes for achieving the present quant. imaging involve: (1) acquisition of raw images in two sep. bands; (2) background

correction; (3) blackbody calibration of imagers; (4) normalization of individual pixel output; and (4) determination of species and temperature distributions. Before these processes are discussed, a high frame rate IR imaging system is explained.

L1 ANSWER 9 OF 9 CAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1991:66509 CAPLUS

DOCUMENT NUMBER: 114:66509

TITLE: Algorithm and program for calculation of radiation properties of combustion products for the zonal study of heat transfer in burners and furnaces

AUTHOR(S): Zhuravlev, Yu. A.; Shishkanov, O. G.; Daminich, I. Ya.

CORPORATE SOURCE: USSR

SOURCE: Teploobmen i Gidrodinam., Krasnoyarsk (1990) 47-56

From: Ref. Zh., Metall. 1990, Abstr. No. 9B28

DOCUMENT TYPE: Journal

LANGUAGE: Russian

AB Title only translated.

L2 ANSWER 1 OF 4 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1999:688263 CAPLUS

DOCUMENT NUMBER: 131:301112

TITLE: "Influence of gas radiation on combustion on surface burners"

AUTHOR(S): *Lammers, F. A.; Bouma, P. H.; De Goey, L. P. H.; Van Steenhoven, A. A.*

CORPORATE SOURCE: Department of Mechanical Engineering, Eindhoven University of Technology, Eindhoven, 5600 MB, Neth.

SOURCE: **PVP (American Society of Mechanical Engineers) (1999), 397**

**(Computational Technologies for Fluid/Thermal/Structural/Chemical Systems with Industrial Applications, Vol. 1), 209-217**

CODEN: APVPDM; ISSN: 0277-027X

PUBLISHER: American Society of Mechanical Engineers

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The effect of gas radiation on the temperature decrease in the post-flame zone of flat flames is investigated. Flat flames are stabilized on surface burners and provide the framework for the laminar flamelet concept used in turbulent combustion. Flat flames can be modelled using a one-dimensional model with complex chemical to obtain accurate predictions for the temperature and species profiles in the preheating zone and the flame front. However, the temperature profile in the post-flame zone, which governs the relatively slow CO conversion and NO formation, is mainly determined by gas radiation, which is essentially three-dimensional of nature. The temperature decrease due to gas radiation depends on the difference between emission and absorption, which in turn depends on the dimensions of the hot gas volume and thus on the burner dimensions. The limiting cases of the burner dimensions are therefore investigated first. A very small burner is modelled using the optical thin limit where self absorption is neglected. An infinite 1D burner is modelled using the Edwards exponential wide band model. The results of these calcns. show that a large difference exists in the temperature decrease between the two limiting cases. The relation between the burner size and the heat loss

due to gas radiation is further investigated by simulating the post-flame zone and the environment using a 2D axi-sym. model. The temperature decrease is subsequently correlated to the results of the one-dimensional model in which the radiative heat loss is calculated using the optical thin model scaled by a geometry factor. A relation for this geometry factor is proposed based on these results and the limiting situations. Using these relations the radiative heat loss can be calculated in a one-dimensional model or, possibly, in laminar flamelet models for turbulent flames while incorporating the effect of self absorption of radiation by the hot gases. REFERENCE COUNT: 9

L2 ANSWER 2 OF 4 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1999:552501 CAPLUS

DOCUMENT NUMBER: 131:172118

TITLE: Premixed combustion on ceramic foam burners

AUTHOR(S): Bouma, P. H.; De Goey, L. P. H.

CORPORATE SOURCE: Eindhoven University of Technology, Eindhoven, 5600 MB, Neth.

SOURCE: Combustion and Flame (1999), 119(1/2), 133-143

CODEN: CBFMAO; ISSN: 0010-2180

PUBLISHER: Elsevier Science Inc.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Combustion of a lean premixed methane-air mixture stabilized on a ceramic foam burner was studied. The stabilization of the flame in the radiant mode was simulated using a one-dimensional numerical model for a burner stabilized flat-flame, taking into account the heat transfer between the gas and the burner and the radiative properties of the ceramic material. The combustion was modeled with the skeletal mechanism and the nitrogen chemical using an accurate postprocessing technique based on the reaction mechanism of P. Glarborg et al. (1992). It is shown that the flue gas temperature is decreased significantly in the radiant mode. The emissions of CO and NO are therefore considerably lower compared to combustion in the blue-flame mode. The numerical results are validated with expts. The temperature of the flue gases and the surface are measured in combination with the concns. of the pollutants CO and NO. The temps. were obtained with nonintrusive techniques. Coherent anti-Stokes Raman scattering (CARS) was used for the gas temperature and IR pyrometry for the surface temperature measurements. Gas samples were obtained with a suction probe and analyzed further by an IR absorption technique (CO) and by a chemiluminescence analyzer (NO). From a comparison of the exptl. and computational results the ceramic burner is chemical inert, since the results are similar to those for water cooled flat-flame burners. It is shown that modeling of the gas radiation is essential for an accurate prediction of CO in the post-flame zone. Furthermore, prompt NO, as well as the thermal NO, mechanisms are important for an accurate prediction of the total NO emission for combustion in the radiant mode. REFERENCE COUNT: 23

L2 ANSWER 3 OF 4 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1995:929771 CAPLUS

DOCUMENT NUMBER: 124:12076

TITLE: "Scaling characteristics of the aerodynamics and low NO<sub>x</sub> properties of industrial natural gas burners scaling 400 study. Part 4. 300 kW BERL test results. Topical report, October 1992-December 1993"

AUTHOR(S): *Sayre, A.; Lallemand, N.; Dugue, J; Weber, R.*

CORPORATE SOURCE: International Flame Res. Foundation, Ijmuiden, Neth.

SOURCE: **Report (1994), GRI-94/0186; Order No. PB95-148524, 132 pp. Avail.:**

**NTIS From: Gov. Rep. Announce. Index (U. S.) 1995, 95(7), Abstr. No. 516,700**

DOCUMENT TYPE: Report

LANGUAGE: English

AB The report is the 4th part of a series describing the SCALING 400 study into the scaling of the aerodynamics and low NO<sub>x</sub> characteristics of industrial natural gas burners over the thermal input range from 30 to 12 MW. The Part IV report describes the results of 300 kW burner tests carried out at a Burner Research Engineering Laboratory. Comprehensive in-flame measurements were carried out in high-NO<sub>x</sub> (unstaged) flames and in low-NO<sub>x</sub> (staged) flames under conditions of low and high heat extraction. Radiation plays a crucial role in extracting the energy from the post flame zone and therefore controls the external recirculations zone temperature. The flame temperature and consequently NO<sub>x</sub> emissions are strongly dependent on the latter through the jet entrainment.

L2 ANSWER 4 OF 4 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1974:562936 CAPLUS

DOCUMENT NUMBER: 81:162936

TITLE: Analysis of flame emissions by laser Raman spectroscopy

AUTHOR(S): Setchell, Robert E.

CORPORATE SOURCE: Tech. Staff, Aerodyn Div., Livermore, CA, USA

SOURCE: West. States Sect., Combust. Inst. [Pap.] (1974), WSS/CI-74-6, 50 pp.

CODEN: WSCPAH

DOCUMENT TYPE: Report

LANGUAGE: English

AB The post-flame regions of CH<sub>4</sub>-air flames were examined by Raman spectrometry by using an ellipsoidal mirror system to enhance the laser power incident on a small radiation-scattering volume. The accuracy of measuring flame gas concns. with the system can be predicted if temperature-dependent proportionality factors are known. Calcns. of spectrometer-resolved Q-branch bands of N at elevated temps. permitted accurate measurement of temps. from recorded N spectra. Axial and transverse temperature distribution in the post-flame gases were measured. Q-branch bands of CO<sub>2</sub>, O, and H in the flame were recorded for various fuel-air ratios, and the band intensities qual. agreed with concns. predicted from equilibrium calcns. Theor. calcns. of CO bands at elevated temps. enabled the determination of absolute CO concns. for rich flames; the measured values agreed with concns. found from equilibrium calcns. by using measured temps. to within 8%.

L5 ANSWER 1 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:610487 CAPLUS

TITLE: Fire detection sensors

INVENTOR(S): Carter, Christopher Frederick  
PATENT ASSIGNEE(S): Infrared Integrated Systems Ltd., UK  
SOURCE: U.S. Pat. Appl. Publ.

CODEN: USXXCO

DOCUMENT TYPE: Patent

PATENT NO. KIND DATE APPLICATION NO. DATE

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US 2002109096 A1 20020815 US 2002-71589 20020208

EP 1233386 A2 20020821 EP 2002-250790 20020206

EP 1233386 A3 20030709

GB 2372317 A1 20020821 GB 2002-2796 20020206

GB 2372317 B2 20030416 PRIORITY APPLN. INFO.: GB 2001-3632 A

20010214 GB 2001-5111 A 20010301

AB A flame detection apparatus has a focused array based sensor which is responsive to radiation having a predefined wavelength for generating an image of the infrared radiation emitted within a monitored region, and means for measuring the spectral ratio of the intensity of radiation having a first wavelength emitted within the monitored region to the intensity of radiation having a second wavelength emitted within the monitored region. Processing means analyses the output of the focused array based sensor and the spectral ratio measuring means for responses indicative of the presence of a flame within the monitored region.

L5 ANSWER 2 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:424608 CAPLUS

DOCUMENT NUMBER: 135:182694

TITLE: "Diode-laser sensor for monitoring multiple combustion parameters in pulse detonation engines"

AUTHOR(S): Sanders, Scott T.; Baldwin, Jeffrey A.; Jenkins, Thomas P.; Baer, Douglas S.; Hanson, Ronald K.

CORPORATE SOURCE: High Temperature Gasdynamics Laboratory Department of Mechanical Engineering, Stanford University, Stanford, CA, 94305, USA

SOURCE: Proceedings of the Combustion Institute (2000), 28(Pt. 1), 587-593

CODEN: PCIRC2

PUBLISHER: Combustion Institute

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Diode-laser absorption spectroscopy techniques have been adapted and applied for in situ measurements of pertinent combustion parameters in pulse detonation engines (PDEs). A sensor employing five multiplexed diode lasers operating in the 1300-1800 nm spectral region was developed for monitoring gas temperature, H<sub>2</sub>O concentration, liquid fuel concentration, and soot volume fraction. Gas temperature is determined from the ratio of H<sub>2</sub>O absorbances at different wavelengths; water mole fraction and fuel and soot volume fractions are determined from the measured gas temperature and absorbances at selected wavelengths. The sensor's time response (0.5 <SYM109>s) and non-intrusive nature make it suitable for measurements in the hostile environment generated by PDEs. The sensor was used to monitor a 4 cm diameter PDE operating on a



JP-10/oxygen aerosol. Measurements revealed charges of nonuniform equivalence ratio at ignition. Detonations processing such charges reached 95% of the Chapman-Jouget velocity and gas pressures predicted for a stoichiometric, uniform load. Gas temperature and H<sub>2</sub>O concentration, however, reached only .apprx.50% of the Chapman-Jouget predictions, as a result of the decreasing fuel concentration along the length of the engine. The sensor also revealed the presence of hot H<sub>2</sub>O for a long duration (> 100 ms) relative to the duration of the pressure pulse (.apprx.500 <SYM109>s) in the blowdown following the detonation. The engine performance information recorded by the sensor is expected to enhance PDE modeling and optimization efforts, potentially enabling PDE combustion control. REFERENCE COUNT: 23

L5 ANSWER 3 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:663765 CAPLUS

TITLE: Fire monitoring method. [Machine Translation].

INVENTOR(S): Akiyoshi, Takashi; Taniguchi, Hiroshi; Motomura, Masaki; Hiwata, Tetsuya

PATENT ASSIGNEE(S): Nittetsu Elecs K. K., Japan; Nippon Steel Corp.

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

PATENT NO. KIND DATE APPLICATION NO. DATE

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JP 2000259966 A2 20000922 JP 1999-65051 19990311

PRIORITY APPLN. INFO.: JP 1999-65051 19990311

AB [Machine Translation of Descriptors]. There being a usually necessary for the infrared radiation sensor and the ultraviolet sensor to inspect inside the supervisory territory heat source, offers the fire monitoring method which can prevent erroneous judgement. As ultraviolet sensor 40 is used for the 1st optical sensor in the fire monitoring method which watches the occurrence of fire from the occurrence condition of the ultraviolet ray and the infrared radiation which occur from supervisory territory 10 making use of with the 1st optical sensor which inspects the ultraviolet ray which occurs from the flame and the 2nd optical sensor which inspects the infrared radiation,, to do the image processing which excludes the non- inspection part 20 in supervisory territory 10 making use of infrared radiation camera 30, furthermore, concerning the picture signal R from of infrared radiation camera 30 in the 2nd optical sensor, brightness output V1 and non- inspection part 20 from of ultraviolet sensor 40 Fire occurrence output F is given out when both parties of brightness output R3 from of the infrared radiation camera 30 which is excluded have been above the respective specified level.

L5 ANSWER 4 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:440127 CAPLUS

DOCUMENT NUMBER: 133:61197

TITLE: Flame monitoring method and device in combustion of hydrocarbon fuel

INVENTOR(S): Forbes, Stewart; Powell, Brian

PATENT ASSIGNEE(S): Forney Corporation, USA

SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

PATENT NO. KIND DATE APPLICATION NO. DATE

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JP 2000180363 A2 20000630 JP 1999-356015 19991215

GB 2344883 A1 20000621 GB 1998-27719 19981216

GB 2344883 B2 20031029

KR 2000047566 A 20000725 KR 1999-47259 19991028

US 6247918 B1 20010619 US 1999-438781 19991112

PRIORITY APPLN. INFO.: GB 1998-27719 A 19981216

AB The device used for monitoring flame, includes a sensor for reacting to electromagnetic radiation discharged from the flame of transient species (e.g., OH, CH) having narrow wave length, sensor for reacting to electromagnetic radiation discharged from the flame of each non-transient species (e.g., H<sub>2</sub>O, CO<sub>2</sub>) having narrow wave length, resp., and a CPU for processing the outputs from the sensors to obtain air-fuel ratio, for stoichiometry of combustion process to improve combustion efficiency and decrease pollution.

L5 ANSWER 5 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1997:763280 CAPLUS

DOCUMENT NUMBER: 128:5420

TITLE: Diode laser sensor for measurements of CO, CO<sub>2</sub>, and CH<sub>4</sub> in combustion flows

AUTHOR(S): Mihalcea, Radu M.; Baer, Douglas S.; Hanson, Ronald K.

CORPORATE SOURCE: High Temp. Gasdynamics Lab., Dep. Mechanical Engineering, Stanford Univ., Stanford, CA, 94305-3032, USA

SOURCE: Applied Optics (1997), 36(33), 8745-8752

CODEN: APOPAI; ISSN: 0003-6935

PUBLISHER: Optical Society of America

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A fiber-optic diode laser sensor was used to monitor CO, CO<sub>2</sub>, and CH<sub>4</sub> in combustion gases with absorption spectroscopy and fast extraction-sampling techniques. Survey spectra of the CO 3<SYM110> band (R-branch) and the 2<SYM110>1 + 2<SYM110>20 + <SYM110>3 CO<sub>2</sub> band (R-branch) near 6350 cm<sup>-1</sup> and H<sub>2</sub>O lines from the <SYM110>1 + 2<SYM110>2 and 2<SYM110>2 + <SYM110>3 bands in the 6345-6660 cm<sup>-1</sup> spectral region were recorded and compared with calculated spectra (from the HITRAN 96 database) to select optimum transitions for species detection. Species concns. above a laminar premixed methane-air flame were determined from measured absorption in a fast-flow multipass absorption cell containing probe-sampled combustion gases; good agreement was found with calculated chemical equilibrium values. REFERENCE COUNT: 10

L5 ANSWER 6 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1997:334824 CAPLUS

DOCUMENT NUMBER: 126:307215

TITLE: System and method for monitoring combustion and pollutants by means of laser diodes

INVENTOR(S): Calabro', Bruno; Frontini, Luis; Repetto, Francesco

PATENT ASSIGNEE(S): Finmeccanica S.P.A. Azienda Ansaldo, Italy

SOURCE: Eur. Pat. Appl., 12 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

PATENT NO. KIND DATE APPLICATION NO. DATE

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EP 766080 A1 19970402 EP 1995-830401 19950929

PRIORITY APPLN. INFO.: EP 1995-830401 19950929

AB A system for monitoring combustion and pollutants developed in a combustion chamber comprising at least one longitudinal single mode laser diode emitting a beam of electromagnetic radiation with a frequency modulated around the resonance frequency of a specific spectral absorption line of a component of the combustion gases, means for directing the beam into the combustion chamber along a path through the combustion gases to a radiation sensor and processing means connected to the sensor to identify the temperature of the combustion gases and the concentration of the component with the specific absorption line by the measurement of the intensity of radiation transmitted at various frequencies in a region surrounding the resonance frequency.

L5 ANSWER 7 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1979:408187 CAPLUS

DOCUMENT NUMBER: 91:8187

TITLE: "Device for monitoring the carbon content in a converter bath"

INVENTOR *Bogushevskii, V. S.; Sabolev, S. K.; Sorokin, N. A.; Glukhovskaya, V. M.*

PATENT ASSIGNEE(S): Kiev Institute of Automation, USSR

SOURCE: U.S.S.R. From: Otkrytiya, Izobret., Prom. Obraztsy, Tovarnye Znaki 1979, (13), 95.

CODEN: URXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Russian

PATENT NO. KIND DATE APPLICATION NO. DATE

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SU 655722 T 19790405 SU 1976-2365034 19760525

PRIORITY APPLN. INFO.: SU 1976-2365034 19760525

AB The device includes units for measuring the flow waste gases and blast and the rarefaction in the gas conduit which are connected to the corresponding samplers, sensors, and a computer. The device also has a mode switch connected to the amplifier and an integrator connected to the units for initial conditions and for measuring the waste gas flow. The accuracy of monitoring is increased by adding sensors for flame radiation intensity in the IR spectra corresponding to maximum absorption of H<sub>2</sub>O and CO<sub>2</sub> being interconnected and connected through the mode switch and the waste gas flow which is also connected to the IR radiation intensity gauge corresponding to the maximum absorption of CO<sub>2</sub>. The device also has units for measuring the moisture content of the

air and the blast which are interconnected and connected to the units for measuring the rarefaction in the gas conduit and the blast rate. The units are also connected to the computer which is connected to the gages for the IR radiation intensity corresponding to maximum absorption of H<sub>2</sub>O and CO<sub>2</sub>.

L5 ANSWER 8 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1974:61944 CAPLUS

DOCUMENT NUMBER: 80:61944

TITLE: Detonations in suspensions of coal dust in oxygen

AUTHOR(S): Nettleton, M. A.; Stirling, R.

CORPORATE SOURCE: Cent. Electr. Res. Lab., Leatherhead/Surrey, UK

SOURCE: Combustion and Flame (1973), 21(3), 307-14

CODEN: CBFMAO; ISSN: 0010-2180

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The growth of an explosion was followed in a vertical tube containing a suspension of coal dust in O<sub>2</sub>. After ignition at the closed top of the tube, acceleration of the flame and growth of the pressure wave ahead of it were monitored by radiation sensors and pressure transducers along the tube. Shock and flame velocities typical of deflagations (.apprx.900 m/sec) were observed in some expts. In others, shock and flame velocities of <SYM163>1500 m/sec were recorded. In these runs, the gas behind the leading shock was sufficiently heated by partial reflections of the shock for a 2nd flame to be formed ahead of the original flame. This phenomenon could lead to the production of a detonation wave traveling at the appropriate Chapman-Jouget velocity (.apprx.2200 m/sec) in a tube of sufficient length.

L7 ANSWER 1 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:361386 CAPLUS

DOCUMENT NUMBER: 129:6350

TITLE: "The effects of unburned carbon on radiative heat transfer in a pilot pulverized coal furnace-numerical investigation"

AUTHOR(S): *Liu, Zhaohui; Xing, Huawei; Zhou, Yingbiao; Zheng, Chuguang*

CORPORATE SOURCE: National Laboratory of Coal Combustion, Wuhan, 430074, Peop. Rep. China

SOURCE: **Proceedings - Annual International Pittsburgh Coal Conference (1997), 14th, S12/11-S12/18**

CODEN: PICNE4; ISSN: 1075-7961

PUBLISHER: Pittsburgh Coal Conference, University of Pittsburgh

DOCUMENT TYPE: Journal; (computer optical disk)

LANGUAGE: English

AB This paper investigates the possible effect of residue char on the radiative heat transfer in a pilot furnace. Firstly, a program is constructed to incorporate radiative properties of particles in solving the radiative heat transfer, based on a computer code for predicting turbulent gas-solid flow and combustion. The radiative properties of single unburnt char are modeled by coated sphere model of Mie theory, while the local Planck average radiative properties of particle cloud be obtained by a scheme based on

Lagrangian approach with particle turbulent dispersion, and the radiative heat transfer is solved by Discrete Transfer method. Then, comparisons are made among predicted results for a pilot-scale pulverized coal furnace by several particulate radiative properties' models. It shows even for the pilot-scale furnace, the effect of particle concentration are more important than that of distinguishing particle as char and ash; the residue carbon in ash has a tendency to enhance the radiative heat transfer for this case; the optimized burn-off rate to sep. ash from char is near 0.65. REFERENCE COUNT: 14

L7 ANSWER 2 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:41730 CAPLUS

DOCUMENT NUMBER: 128:118854

TITLE: Energy self-sustainable reactor for gasifying engine particulates and unburned hydrocarbons

INVENTOR(S): Wang, Chi S.

PATENT ASSIGNEE(S): USA

SOURCE: U.S., 12 pp.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

PATENT NO. KIND DATE APPLICATION NO. DATE

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US 5707593 A 19980113 US 1996-774570 19961231  
WO 9829180 A1 19980709 WO 1997-US21753 19971125  
AU 9878888 A1 19980731 AU 1998-78888 19971125  
EP 952881 A1 19991103 EP 1997-949649 19971125  
CN 1241951 A 20000119 CN 1997-181025 19971125  
CN 1124870 B 20031022  
JP 2001507775 T2 20010612 JP 1998-530010 19971125  
BR 9714653 A 20011030 BR 1997-14653 19971125  
CA 2274067 C 20020625 CA 1997-2274067 19971125

PRIORITY APPLN. INFO.: US 1996-774570 A 19961231  
WO 1997-US21753 W 19971125

AB A reactor that can be attached to the exhaust manifold of an internal combustion engine to oxidize and burn carbon soot particles, carbon monoxide, and unburned hydrocarbons, and to dissociate nitrogen and sulfur oxides is described. The reactor has a reaction zone that contains porous heat-retaining foam cells and that is bounded by a porous heat-retaining zone, which in turn is surrounded by ceramic insulation materials to minimize energy losses. Engine exhaust at elevated temps. and containing some oxygen (air) enters the reaction chamber. By means of impinging heat transfer, thermal radiation enhancement, energy trapping and combustion of engine emissions, temps. sufficient to oxidize carbon soot particles, carbon monoxide, and unburned hydrocarbons are attained. Steam or atomized water droplets are introduced to improve the efficiency of the reactor through gasification, regasification, water shift reactions, methanation, and hydrocracking reactions. Harmless product of the oxidation reactions, H<sub>2</sub>O and CO<sub>2</sub>, are released from the reactor. REFERENCE COUNT: 17

L7 ANSWER 3 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1997:262658 CAPLUS

DOCUMENT NUMBER: 126:320463

TITLE: Constituents of engine exhaust

INVENTOR(S): Wang, Chi-Shang

PATENT ASSIGNEE(S): Wang, Chi-Shang, USA

SOURCE: U.S., 8 pp.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

PATENT NO. KIND DATE APPLICATION NO. DATE

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US 5618500 A 19970408 US 1995-517345 19950821

PRIORITY APPLN. INFO.: US 1995-517345 19950821

AB A reactor that can be attached to the exhaust manifold of a diesel or gasoline engine, or other internal combustion engines such as a jet engine or a gas turbine to oxidize and burn carbon soot particles, carbon monoxide, and unburned hydrocarbons, and to dissociate nitrogen and sulfur oxides is described. The reactor has a reaction zone that contains porous heat-retaining foam cells and that is bounded by a porous heat-retaining zone, which in turn is surrounded by ceramic insulation materials to minimize energy losses. Engine exhaust at elevated temps. and containing some oxygen (air) enters the reaction chamber. By means of impinging heat transfer, thermal radiation enhancement, energy trapping and combustion of engine emissions, temps. sufficient to oxidize carbon soot particles, carbon monoxide, and unburned hydrocarbons are attained. Harmless product of the oxidation reactions, H<sub>2</sub>O and CO<sub>2</sub> are released from the reactor.

L7 ANSWER 4 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1996:517850 CAPLUS

DOCUMENT NUMBER: 125:171910

TITLE: Application of the discrete ordinates radiation model to internal combustion engine heat transfer calculations

AUTHOR(S): Chapman, Kirby S.; Vance, Judd

CORPORATE SOURCE: Department Mechanical Engineering, Kansas State University, Manhattan, KS, USA

SOURCE: ICE (American Society of Mechanical Engineers) (1995), 25(Proceedings of the 17th Annual Fall Technical Conference of the ASME Internal Combustion Engine Division, 1995, Vol. 2), 1-7

CODEN: ICEIEG; ISSN: 1066-5048

PUBLISHER: American Society of Mechanical Engineers

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Radiative heat transfer has been exptl. shown to account for up to 40% of the total heat transfer within an internal combustion engine. Accurate representation of radiation heat transfer in the cylinder of an internal combustion engine is a very complex process that depends on the cylinder and piston bowl geometry, the temperature gradients within the cylinder, the degree to which combustion has occurred, the air-to-fuel ratio, soot, and

engine load. Radiation calcns. are important since they directly affect the cylinder gas temps. through the conservation of energy equation, which then affect predictions of the oxides of nitrogen (NOx). In-cylinder radiation has been approximated in many different ways, but the modeling methods applied to date generally use a "temperature to the fourth power" approximation. The predicted radiant heat flux is then "calibrated" to match exptl. data by correcting the predicted flux with a pseudo-gas emissivity. Often times, because of the lack of detail in the radiation model, the pseudo-gas emissivity falls outside the range of zero to one. These models tend to be very engine specific and, therefore, do not apply to large a range of engine cylinders and piston geometries. The combustion products within the cylinder are largely composed of carbon dioxide and water vapor, both of which are strong radiative emitters and absorbers. The unburned gases are composed of air, which is radiatively transparent, and vaporized fuel. In order to treat the volumetric radiative heat transfer phenomenon from the carbon dioxide and water vapor accurately and generally, a much more rigorous model must be applied that accounts for temperature nonuniformity and species concentration nonuniformity throughout the cylinder. This paper reports results obtained by applying the discrete ordinates model approximation of the radiative transfer equation to an engine cylinder. The in-cylinder temps. as functions of engine crank angle are first predicted by a three zone engine model, described in the open literature. The three gas zones are the burned, unburned, and boundary layer zones. This three zone model predicts the temperature and species fields within the cylinder. Once these fields are calculated, the discrete ordinates model is used to calculate the radiant intensity field and radiant flux fields. The in-cylinder gases are treated as non-gray by implementing a weighted sum-of-gray-gases model for the absorption coefficient

L7 ANSWER 5 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1993:106186 CAPLUS

DOCUMENT NUMBER: 118:106186

TITLE: Monitoring of unburned carbon in coal combustion ash by laser-induced combustion

INVENTOR(S): Cioni, Mario; De Michele, Gennaro; Musci, Mirella; Curcio, Franco

PATENT ASSIGNEE(S): ENEL - Ente Nazionale per l'Energia Elettrica, Italy

SOURCE: U.S., 5 pp.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

PATENT NO. KIND DATE APPLICATION NO. DATE

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US 5155047 A 19921013 US 1990-585186 19900920

PRIORITY APPLN. INFO.: IT 1989-21912 19891003

AB The unburned carbon content in coal combustion ash is determined by transferring an ash sample into a hermetically sealed cell under a controlled pressure, replacing the atmospheric in the cell with a known amount of combustion-supporting gas, irradiating the sample with a laser beam to ignite the unburned carbon, and determining the amount of CO<sub>2</sub> (and unreacted O) with a calibrated detector. The determination of unburned

carbon in the ash sample is a measure of the combustion efficiency in the coal. The laser beam is preferably from a CO<sub>2</sub> laser and has a power of 20-30 W.

L7 ANSWER 6 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1991:9341 CAPLUS

DOCUMENT NUMBER: 114:9341

TITLE: A new approach to reduction of carbon dioxide emission by radiation controlled combustion

AUTHOR(S): Echigo, Ryozi; Yoshida, Hideo; Hanamura, Katsunori; Okuyama, Masaaki; Koganezawa, Tomomi; Hijikata, Kunio

CORPORATE SOURCE: Fac. Eng., Tokyo Inst. Technol., Tokyo, 152, Japan

SOURCE: Enerugi, Shigen (1990), 11(4), 358-63

CODEN: ENESEB; ISSN: 0285-0494

DOCUMENT TYPE: Journal

LANGUAGE: Japanese

AB A proposal was made for radiation controlled combustion of fossil fuels to reduce CO<sub>2</sub> emission. The proposal mentioned that to reduce CO<sub>2</sub> emission the carbons contained in fossil fuels should not be completely burned, but some of them should be kept unburned in the form of soot; e.g., fossil fuels should be burned with less air than that required for complete combustion. Although more fuel will be required (.apprx.20-30% increase for reduction of CO<sub>2</sub> by approx. 20%), the increase in fuel cost will be less than the expenses for transforming CO<sub>2</sub> into dry ice and for dumping it to the bottom of the sea. The results of expts. of radiation controlled combustion of CH<sub>4</sub> showed that luminous flame was observed and soot was formed when it was burned using a porous ceramic combustor.

L7 ANSWER 7 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1968:479025 CAPLUS

DOCUMENT NUMBER: 69:79025

TITLE: Rapid reignition for in situ combustion oil recovery

INVENTOR(S): Milton, Harry W., Jr.

PATENT ASSIGNEE(S): Marathon Oil Co.

SOURCE: U.S., 2 pp.

CODEN: USXXAM

DOCUMENT TYPE: Patent

PATENT NO. KIND DATE APPLICATION NO. DATE

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US 3398793 A 19680827 US 1966-553317 19660527

PRIORITY APPLN. INFO.: US 1966-553317 19660527

AB A method is described for reigniting a combustion zone in a petroleum formation by injecting a gaseous mixture of O and a fuel into a formation having a burned-out zone and an unburned organic compound-bearing zone. The mixture is then ignited through <SYM179>1 well in the burned-out zone located <SYM179>10 ft. from the interface between the burned-out zone and the unburned zone to produce a gas combustion front that reignites the carbonaceous material in place at the interface. Thus, rapid reignition is accomplished by injecting into former production wells a mixture of 9.5% by volume



CH<sub>4</sub> and 90.5% by volume air. Injection is continued until the entire burned-out portion is filled with the mixture and then an elec. igniter at the bottom of the well is actuated. A gas combustion front radiates rapidly outward from the base of the air injection well and reignites the carbonaceous material at the interface between the burned-out and unburned portion of the formation.

L8 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2003:414414 CAPLUS

DOCUMENT NUMBER: 138:394993

TITLE: IR lamps emitting 5-6 <SYM109>m IR for nitrogen oxide gas sensors and detectors

INVENTOR(S): Yamashita, Kazuhiko; Matsubara, Kazuaki

PATENT ASSIGNEE(S): Oshino Denki K. K., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

PATENT NO. KIND DATE APPLICATION NO. DATE

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JP 2003157807 A2 20030530 JP 2001-357347 20011122

PRIORITY APPLN. INFO.: JP 2001-357347 20011122

AB The lamp comprises a glass bulb enclosing a filament and a gas, and double-layer coatings on the bulb comprising a ceramic lower thin films formed by thermal spraying process and a titanium oxide upper thin film formed by applying a solution The lamp emits IR from both the filament itself and the double-layer coatings (at the time that the lamp itself is heated). The lamp shows high emissivity.

L8 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:529833 CAPLUS

DOCUMENT NUMBER: 133:154647

TITLE: Exhaust gas purification system using magnesium-containing catalyst with temperature control

INVENTOR(S): Nakamura, Masanori; Suga, Katsuo; Morita, Hiroshi

PATENT ASSIGNEE(S): Nissan Motor Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

PATENT NO. KIND DATE APPLICATION NO. DATE

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JP 2000213338 A2 20000802 JP 1999-13028 19990121

PRIORITY APPLN. INFO.: JP 1999-13028 19990121

AB The system includes a means for pre-detecting temperature of the exhaust gas before inlet of the catalyst, a cooler for cooling the gas based on the temperature detected by the sensor to adjust temperature to a desired value, a NO<sub>x</sub>-adsorbing catalyst containing element to have free-energy change <SYM68>G<SYM179>-350 kJ/mol (e.g.,

Mg, La, Mn, Fe), and a means for radiation of electromagnetic wave over the catalyst for heating, to avoid sulfur poisoning of the catalyst.

L12 ANSWER 1 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2003:414414 CAPLUS

DOCUMENT NUMBER: 138:394993

TITLE: IR lamps emitting 5-6  $\mu$ m IR for nitrogen oxide gas sensors and detectors

INVENTOR(S): Yamashita, Kazuhiko; Matsubara, Kazuaki

PATENT ASSIGNEE(S): Oshino Denki K. K., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

PATENT NO. KIND DATE APPLICATION NO. DATE

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JP 2003157807 A2 20030530 JP 2001-357347 20011122

PRIORITY APPLN. INFO.: JP 2001-357347 20011122

AB The lamp comprises a glass bulb enclosing a filament and a gas, and double-layer coatings on the bulb comprising a ceramic lower thin films formed by thermal spraying process and a titanium oxide upper thin film formed by applying a solution. The lamp emits IR from both the filament itself and the double-layer coatings (at the time that the lamp itself is heated). The lamp shows high emissivity.

L12 ANSWER 2 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2003:312209 CAPLUS

DOCUMENT NUMBER: 138:342755

TITLE: Chemical sensor made from quartz oscillator coated by  
nanoporous polymer thin film for monitoring  
environmental pollution gases and manufacture thereof

INVENTOR(S): Sugimura, Hiroyuki; Takai, Osamu; Kim, Gyu Baek

PATENT ASSIGNEE(S): Nagoya University, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

PATENT NO. KIND DATE APPLICATION NO. DATE

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JP 2003121329 A2 20030423 JP 2001-320555 20011018

PRIORITY APPLN. INFO.: JP 2001-320555 20011018

AB The process comprises the steps of (1) preparation a solution containing polyethylene oxide-polypropylene oxide-polyethylene oxide block copolymer and tetraethoxysilane, (2) applying the solution on a quartz oscillator using a spin-casting method to form a polymer-silica composite film, (3) directing UV light to the film to photodecompose organic materials in the film, thereby forming a nm-order pores on the

surface. The chemical sensor works as a NO<sub>x</sub> and SO<sub>x</sub> sensor when the pores are coated by an amino group.

L12 ANSWER 3 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:529833 CAPLUS

DOCUMENT NUMBER: 133:154647

TITLE: Exhaust gas purification system using magnesium-containing catalyst with temperature control

INVENTOR(S): Nakamura, Masanori; Suga, Katsuo; Morita, Hiroshi

PATENT ASSIGNEE(S): Nissan Motor Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

PATENT NO. KIND DATE APPLICATION NO. DATE

-----  
JP 2000213338 A2 20000802 JP 1999-13028 19990121

PRIORITY APPLN. INFO.: JP 1999-13028 19990121

AB The system includes a means for pre-detecting temperature of the exhaust gas before inlet of the catalyst, a cooler for cooling the gas based on the temperature detected by the sensor to adjust temperature to a desired value, a NO<sub>x</sub>-adsorbing catalyst containing element to have free-energy change <SYM68>G<SYM179>-350 kJ/mol (e.g., Mg, La, Mn, Fe), and a means for radiation of electromagnetic wave over the catalyst for heating, to avoid sulfur poisoning of the catalyst.

L12 ANSWER 4 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1999:563673 CAPLUS

DOCUMENT NUMBER: 131:208185

TITLE: Effect of constituent layers on the sensitivity and selectivity of multilayer gas sensors

AUTHOR(S): Kaciulis, S.; Mattogno, G.; Napoli, A.; Galdikas, A.; Dapkus, L.; Mironas, A.; Setkus, A.

CORPORATE SOURCE: Istituto di Chimica dei Materiali, Monterotondo, 00016, Italy

SOURCE: Sensors and Microsystems, Proceedings of the Italian Conference, 3rd, Genova, Feb. 11-13, 1998 (1999), Meeting Date 1998, 149-154. Editor(s): Di Natale, Corrado; D'Amico, Arnaldo; Sberveglieri, Giorgio. World Scientific: Singapore, Singapore.

CODEN: 68BGJ

DOCUMENT TYPE: Conference

LANGUAGE: English

AB Multilayer gas sensors based on a thin metal film (Pt, Au, Mo, Ni, etc.), which is covered with top-layer of SnO<sub>2</sub>, were studied exptl. Technol. possibilities to modify the sensitivity and selectivity of multilayer sensors were revealed. The exptl. results obtained for the structures consisting of two and three layers were summarized. An optimum thickness of the top-layer was evaluated for multilayer sensors. The properties of the interface between the bottom- and the top-layer are dependent on addnl. inter-layer of Ni,

which modified the sensitivity and selectivity of the sensor. The interface was also modified by x-ray radiation. The point defects induced by this radiation produced significant effect on the response of the Pt-based structure. Depth profiles of the chemical composition were obtained for multilayer sensors by combining XPS anal. with Ar<sup>+</sup> etching. The three-layer structure consists of a pile of ultra-thin layers, and the bottom-layer is practically metallic. The changes of the electron transport induced by an extra charge on the surface or in the interface seem to be the most probable origin of the resistance response to gases in multilayer sensors. REFERENCE COUNT: 7

L12 ANSWER 5 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1997:802708 CAPLUS

DOCUMENT NUMBER: 128:52272

TITLE: Integrated thin film fluorescence NO<sub>x</sub> sensor: concept

AUTHOR(S): Tuma, Margaret; Gruhlke, Russell

CORPORATE SOURCE: NASA Lewis Res. Cent., Cleveland, OH, 43050, USA

SOURCE: Proceedings of SPIE-The International Society for Optical Engineering (1997), 3172(Optical Technology in Fluid, Thermal, and Combustion Flow III), 98-105

CODEN: PSISDG; ISSN: 0277-786X

PUBLISHER: SPIE-The International Society for Optical Engineering

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A fluorescence sensor system is proposed that integrates emission and detection methods as well as optical and electronic components in a thin film geometry. Predicted properties of this sensor include: increased sensitivity, shielding from unwanted radiation, wavelength filtering, potential operation at high temps., and miniaturization. The sensor can be tuned to measure a wide variety of species by varying its thin film corrugation periodicity, in particular, the sensor can be used to detect NO<sub>x</sub>.

REFERENCE COUNT: 17

L12 ANSWER 6 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1996:179207 CAPLUS

DOCUMENT NUMBER: 124:210468

TITLE: Apparatus for remote analysis of vehicle emissions using reflective thermography

INVENTOR(S): Stedman, Donald H.; Bishop, Gary A.

PATENT ASSIGNEE(S): Denver Seminary, USA

SOURCE: U.S., 25 pp., Cont.-in-part of U.S. 5,401,967.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 3

PATENT NO. KIND DATE APPLICATION NO. DATE

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US 5489777 A 19960206 US 1995-398359 19950303

US 5210702 A 19930511 US 1990-633952 19901226

US 5319199 A 19940607 US 1992-895342 19920608  
US 5401967 A 19950328 US 1994-253749 19940603  
PRIORITY APPLN. INFO.: US 1990-633952 A2 19901226  
US 1992-895342 A2 19920608 US 1994-253749 A2 19940603

AB A system for remote anal. of vehicle emissions dets. whether each engine and exhaust system are hot or cold by measuring IR radiation reflected by the roadway beneath the vehicle. A source transmits a beam of radiation through a portion of the motor vehicle exhaust to a number of sensors. Each sensor generates a signal indicative of the absorption of the beam in a wavelength band indicative of a corresponding exhaust gas (e.g., CO, CO<sub>2</sub>, HC, NO<sub>x</sub> and H<sub>2</sub>O). A processor then computes the concns. of each exhaust gas from the sensor signals, and dets. whether the vehicle is hot or cold by measuring the intensity of IR radiation detected by the IR detector. Because cold vehicles can temporarily produce abnormally high pollution emissions, the processor can be programmed to sep. identify hot vehicles having exhaust emissions that exceed air pollution limits. The system can also include a video camera and recorder to record the license plate and emissions data for each vehicle identified as failing to meet emissions limits.

L12 ANSWER 7 OF 8 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1995:410278 CAPLUS

DOCUMENT NUMBER: 122:329264

TITLE: Carbon dioxide laser sensor systems for ammonia

AUTHOR(S): Rupp, Wolfgang; Sauer, R.; Hinz, Alexander

CORPORATE SOURCE: Carl Zeiss, Oberkochen, Germany

SOURCE: Wissenschaftliche Zeitschrift der Technischen Universitaet Dresden (1994), 43(6), 78-9

CODEN: WZTUAU; ISSN: 0043-6925

PUBLISHER: Selbstverlag der Technischen Universitaet Dresden

DOCUMENT TYPE: Journal

LANGUAGE: German

AB A CO<sub>2</sub> laser sensor system for the online detection of NH<sub>3</sub> added as reducing agent for NO<sub>x</sub> to the flue gas of large-scale combustion plants is briefly described. The laser operates with the <sup>13</sup>CO<sub>2</sub> isotope and is excited by a frequency of 80 MHz. The applied laser emission lines of 10.80 and 10.78  $\mu$ m alternate with kHz frequency. The sensor system affords a measuring accuracy of 0.5 ppm.